

# “SENER has technical self-confidence that differentiates us from our competitors”

**Miguel Domingo**

Solar Business Director of SENER

**Question: How is SENER going to embark upon the concentrated solar power market?**

Miguel Domingo: SENER has been active in the solar market since the 1980s but its first major commercial project was, without a doubt, the Andasol-1 project, which was launched towards the end of 2005. As a result, SENER has developed a very strong team specializing in solar thermal power. Andasol-1 was really the start of SENER's solar thermal activity. However, our main project is Gemasolar, which also poses a much greater risk for SENER. Unlike Andasol-1, which is a joint venture between Cobra (80%) and SENER (20%) in which we have no stockholding, we actually own 60% of Gemasolar and are responsible for the EPC.

**Q: SENER develops both parabolic trough collector technology and central tower and heliostat technology. Do you prefer either of these technologies?**

M.D.: They are complementary technologies. Central tower with molten salt receiver technology offers many advantages over parabolic trough technology but there are not yet any commercial plants in operation. When SENER's first commercial project, Andasol-1, based on parabolic trough technology was launched, there were already similar plants in America that had been operating for 20 years while there were still only tower technology prototypes, experimental plants such as Solar Two. Therefore, finding financing for tower plants was much more difficult than for parabolic trough plants. The fact that SENER is involved in so many parabolic trough plants is particularly a matter of opportunity as this type of technology, due to being older and more developed, was what the market demanded and could be financed much more easily by the banks. However, central tower technology is really much simpler: it involves less working fluids, solar field design is simpler and it can be better adapted to the lie of the land due to being made up of independent heliostats... It has simply not yet had the opportunity to be implemented extensively.

We believe, and we have checked it with detailed assessments, that molten-salt tower technology is often superior to parabolic trough

technology. What we must try to achieve is that tower technology receives the same standardization as parabolic trough technology has received. Therefore, the Gemasolar commercial operation in 2011 will be the start of a new learning curve because you can learn a lot with a project and industrialize many aspects and then everything learned can be applied to future tower technology plants. Also, part of the technology for the parabolic trough plants used to come from other companies (from Israel, Germany, etc.) but for the tower plant, we have managed to control all plant costs by developing our own technology. That is one major difference.

**Q: The main technological difference of the solar plants developed by SENER revolves around the storage system. What is that so important?**

M.D.: Plants with storage capacity can continue to operate even when there are clouds in the sky and can offer more working hours as they can continue to produce electricity even when there is no sun. And the important thing to take into account for a plant is its production, the amount of energy that can be sold at the end of the day and how your supply meets the demand curve. Thanks to its storage capacity, even if we have a power of less than 20 MW, as is the case with Gemasolar, we can produce as much energy as a 50 MW parabolic trough plant that has no storage capacity and also supply better controlled electricity to the grid.

I believe that in the future we are going to come face to face with competition for the technologies we have already developed and in time, it seems that these are the technologies being demanded by the market: parabolic trough collector technology with storage system, which already exists and where SENER has clearly differentiated itself from its competition on launching its first commercial project, Andasol-1, with the plan to implement this technology in many more projects; and central tower technology with storage, which is the technology to be launched shortly. The storage system gives the plant very important operating flexibility and that is exactly why the competition is adopting this technology. And that is why here at SENER we are already researching improvements to cut the cost of



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this system. We are coming up with new ideas with each project that will always be applicable to commercial projects.

**Q: Would you say that SENER is today a world leader in solar technology?**

M.D.: We are very well positioned due to all these technological advances. This position has a lot to do with what SENER's employees are like and what the company as a whole is like. For a start, we like technological challenges and know how to face them thanks to the fact that we have highly trained individuals with a global vision of the plant who can integrate all their knowledge and also specialists in each specific discipline who are capable of implementing technological innovations in each project. And we also have a shared culture thanks to our multi-disciplinary nature that sets SENER apart from other engineering companies. For example, knowledge gained from aerospace projects in terms of mechanisms and structures has helped us develop new products for the solar market. And these are innovative approaches that can be applied without fear thanks to the fact that SENER has technical self-confidence that definitely differentiates us from our competition.

**Q: So does SENER have its own team of solar thermal power technologists?**

M.D.: Yes, of course. The solar sector also attracts enormous talent as it has many qualities that motivate individuals who are passionate about engineering: it involves large projects dealing with different technologies, with a high level of innovation, that are followed from beginning to end, from design to commissioning... Today we have

an extensive solar technology team with exceptional experience. Its members have come together as a result of participating in state-of-the-art projects, such as Andasol-1, and they have been involved in all stages of a project, from its preliminary design to its commissioning and follow-up. Also, as SENER is proud to put its people first, these highly experienced professionals continue to work as part of the company with great enthusiasm. We can proudly state that we have a magnificent team of solar technology professionals. And in that regard, in terms of people, we are definitely world leaders. This gives our clients great peace of mind. Of course, you have to be competitive to win a contract but we combine good price with quality work teams that inspire maximum confidence and that is what has helped us take part in so many projects, five of which are already in operation, operating at full capacity. We monitor and follow up on progress at these plants and this follow-up stage forms part of our guarantee with the client and is also an exceptional opportunity to detect improvements that can be implemented in future projects.

**Q: Besides the 15 projects in Spain, where else have you carried out projects?**

M.D.: We offer engineering, construction, operation and maintenance services in the USA and already have two projects underway with an important team of people working there. Spanish companies have a great deal of prestige in renewable energies in the USA, as they do worldwide, and this is one of SENER's target markets; this country also has a social and political will to develop renewable energies. However, the USA is very large and complicated and we have to get the first projects we carry out right. We are also offering solar combined cycle hybridization in North America, in Mexico, which we are building in Agua Prieta. In Abu Dhabi our engineering department is helping Torresol Energy with its projects. Our technology is also being proposed for the Nehru Solar Mission plants in India and we are involved in emerging projects in Australia, South Africa and the MENA region. However, these are projects with a long development period. We must remember that initial projects in a country are always harder as we must adapt to the idiosyncrasies of that country, organize institutional aid, etc. But we expect to grow stronger in all those markets. ■■